

Wildlife and Pollinator Planting, Gallatin County, MT

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Objective: Wildlife and pollinator habitat improvement

County: Gallatin County

Average Annual Precipitation: 18 to 22 inches

MLRA: 43B, Central Rocky Mountains

Dominant Soil Type: Sourdough loam

Elevation: 5100 ft

Site Preparation: Mowed and applied half rate glyphosate herbicide

Seeding Date: May 28, 2014

Seeding Method: Drill seeded at 14 inch row spacing

Acres Seeded: 0.5 acre

Previous Site History: Smooth brome dominated pasture

Herbicide: Glyphosate at half rate (1 qt/ac)

Irrigation: None

Grazing: None

Monitoring Dates: Sept 2014, July 2015, and July 2018



Fig. 1. Drill seeding species into a pasture. Smooth brome was treated with Roundup® prior to seeding but plant litter remained on site.

Introduction:

This project's goal was to improve wildlife and pollinator habitat by seeding five forb and two bunchgrass species. The site was a smooth brome (*Bromus inermis*) dominated pasture. Prior to seeding, the site was sprayed with a half rate of Roundup® (glyphosate) to reduce the smooth brome and open the site for drill seeding. All species were drill seeded at a rate of 25 seeds/ft² (Table 1). The seeding was monitored in 2014, 2015 and 2018 for seeded species density (plants/ft²), vigor, and height (Table 2). After seeding, the site was mowed annually in mid-June and late September. Mowing was used to keep the smooth brome short in stature and increase sunlight to seeded species.

Table 1. Seeded species and their seeding rate.

Scientific Name	Common Name	Cultivar	Seed Rate PLS lbs/ac
<i>Dalea candida</i>	White prairie clover	Antelope	4.0
<i>Dalea purpurea</i>	Purple prairie clover	Bismarck	3.5
<i>Helianthus maximiliani</i>	Maximillian sunflower	Medicine Creek	4.0
<i>Linum lewisii</i>	Lewis flax	Maple Grove	4.0
<i>Ratibida columnifera</i>	Prairie coneflower	Stillwater	2.0
<i>Festuca ovina</i>	Sheep fescue	Covar	2.0
<i>Pseudoroegneria spicata</i>	Bluebunch wheatgrass	Goldar	7.0

Results:

All seeded species established well the first year after seeding, averaging 4 to 8 seedlings/ft² (Table 2). Lewis flax had the highest initial density, but this short-lived perennial's density decreased over time.

By 2018, all species decreased in density as plants developed from seedlings to mature plants. Prairie coneflower and sheep fescue maintained densities of one plant every two square feet by 2018. These two species were reproducing and spreading on the site. White and purple prairie clover had good initial establishment for the first two years following seeding, however; neither species remained on site after 2016. The site was too dry for Maximillian sunflower. It established well, had good vigor and height but in most years the sunflower vegetation wilted and went dormant before flowering.

The smooth brome was injured by the herbicide treatment but the litter remained on site and may have decreased the seed-to-soil contact of the seeded species. Smooth brome re-established on site the summer of 2014, and by 2018 had about 65% canopy cover. The herbicide treatment was not enough to remove smooth brome from the site. Its re-establishment may have decreased seeded species density over time.

Common Name	Density (plants/ft ²)		Vigor		Height (inches)		
	2014	2018	2014	2015	2014	2015	2018
White prairie clover	6.0	0	Poor	Fair	6	12	-
Purple prairie clover	6.1	0	Fair	Poor	3	3	-
Maximillian sunflower	4.3	0.1	Good	Good	6	24	18
Lewis flax	8.8	0.1	Good	Fair	6	24	12
Prairie coneflower	6.1	0.5	Fair	Good	3	12	13
Sheep fescue	--	0.5	Good	Fair	1	3	6
Bluebunch wheatgrass	--	0.01	Good	Good	5	8	8

Summary:

- Prairie coneflower and sheep fescue were the best, long-term performers in the field planting.
- Sheep fescue was slow to establish but is increasing and maintaining itself in the smooth brome field which adds diversity of cover and wintering habitat for pollinator insects.
- A full rate of glyphosate herbicide may have provided better smooth brome control and allowed a higher rate of seeded species establishment.
- The upland site was too dry for Maximillian sunflower to bloom and persist.
- The prairie clovers established well but did not persist on the smooth brome site.



Fig. 2. Maximillian sunflower rows, 2015. It has decreased in density since its initial establishment.



Fig. 3. Prairie coneflower drill row, 2015. It is now reproducing and spreading on site.